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ABSTRACT

Conducted over the past 15 years by the College of Education at Wayne State University (WSU), the studies of several databases that are described in this paper were designed for the specific purpose of providing factual information related to the problems of education in the public schools and in higher education. As a matter of precept the study was carried out on the following lines: (1) only databases that are in the public domain were used; (2) efforts were made to gather the original documents identified by searching the databases; (3) existing software was used with a database when it was available; and (4) descriptive statistics were used in the analysis of data. Descriptions of the use of five databases at WSU--the Educational Resources Information Center (ERIC); the Michigan Professional Personnel Register (MPPR); Computer Based Resource Units; the Michigan Educational Assessment Program (MEAP); and the WSU College of Education Data Base--include explanations of how they were developed for use at the site, and comments on the successes and failures experienced in their use. The 26 references cited include sources that provide detailed descriptions of various studies conducted at WSU and their results. (DJR)

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"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Over the past 15 years, we have explored the use of several data bases for the specific purpose of providing factual information related to the problems of education in the public schools and in higher education.

In the following remarks, we intend to describe our use of four large data bases. We will explain how they were developed for use at our site and comment upon the successes and failures which we have experienced in utilizing each procedure and data base. References are cited which provide detailed descriptions of various studies and their results. This explication may be useful to others who have an interest in using large, non-commercial data bases. It may encourage them to pursue their independent studies. We have also indicated those instances where we erred. Hopefully,.others will be able to recognize these faults and avoid some of the ignoble trapfalls which we encoutered in using educational data bases.

As a first precept, we have used only those data bases which are in the public domain. Even public domain data must be used with discretion to avoid intruding into an individual's personal affairs. Within that group, we would count data bases such as: The Michigan Professional Personnel Register, the Michigan Teacher Certification Record, and the Michigan Educational Assessment Program. In any case, we have eschewed collecting any priviledged or confidential information.

Second, we have attempted to gather the original documents used in collecting information for a given data base. Since the data collection documents as well as the data collection procedures may be changed, it's important to have copies of these documents. For example, the data collected in the MEAP data base was initiated in

1970 and the data format changed each year for almost a decade. That may be an excellent example of refining a measuring instrument, but it's a nightmare for a researcher seeking to observe patterns and consistent trends from one year to the next.

Third, we used existing software with a data base when it was available, as in the case of the computer based resource guides (CBRU) which Harnak developed at SUNY. We wrote original programs in FORTRAN, assembler, or other programming languages to optimize time and expense of data processing to achieve our specific goals.

Fourth, we avoided using ellaborate statistical analyses of data. We are persuaded that the bulk of measures in education are nominal level of measurement (counting) or ordinal level of measurement at best. Therefore, descriptive statistics are generally adequate for our purposes. As circumstances may require, we use nonparametric statistics to draw inferences about populations. With this much prologue, let us consider the ERIC data base.

Education Resources Information Center (ERIC):

The ERIC collection of research reports provides a valuable treasury of information about problems, solutions, and learning opportunities at all levels of education. Abstracts of more than 250,000 reports and conference proceedings are presented in this collection through the monthly periodical, Research in Education (RIE).

Another 250,000 abstracts and references to journal literature are available in the Current Index to Journals in Education (CIJE) part of the ERIC data base.

About 1970 we obtained computer tape copies of all abstracts in

RIE and CIJE. The data base was less than 5 years old at that time, and our efforts to interpret the computer tape format were correspondingly awkward.

In our first program, we were barely able to conduct a search of the latest 20,000 documents in the RIE collection. At that time there were only 80,000 documents in the entire collection, so we had to make four passes over the data base to search the entire file.

The cost for machine time on Wayne State's IBM 360 system was about $40 per question -- which amounted to about $160 per question which went through the entire data base. Fortunately, our research project received a 90% discount on computing charges. That meant that a query of all 80,000 documents in the ERIC file was ($160) x (10%) or $16 hard cash cost for each question.

During the next decade, we improved the speed of the search program, conducted batch searches of 15 to 20 questions. We developed a simple, on-line interview program so that faculty and students could enter their name and 1 to 3 descriptors;, then, choose from six Boolean expressions to indicate the way they wanted the descriptors to be combined in their individual search question.

Now, faculty arrange for graduate students in their classes to enter search questions on-line or through a simple search request form. In the Spring 1986 we will start orientation seminars for undergraduate and graduate students, so that they may submit on-line ERIC search requests from public terminals on campus or from remote terminals/microcomputers at home.

Computer searches of the ERIC data base now provide access to more than 250,000 RIE abstracts and more than 250,000 CIJE abstracts of journal articles. A typical question costs about $4.00 computing

time using the University's Amdahl 470/v8 and Xerox 9700 printer. With an 80% subsidy of computing costs, the typical question costs ($4.00) x (20%) or $.80 to search a data base of more than 1/2 million documents.

Successes:

During the past decade we have kept pace with the growth of the ERIC facility in providing machine searches of the professional literature covering a large number of topics and problems faced by teachers and administrators in our urban schools. We normally conduct 1500 searches each year and we do not charge any student or faculty member for the cost of the search. This contrasts with the 30 to 40 searches of the ERIC data base conducted by the University Library staff using the commercial service with a charge of $5 to $10 per question. While the total number of documents in the data base have increased tenfold from our early searches, we have reduced the cost of a single comprehensive search by 75%.

We have simplified access to the ERIC search system so that faculty, undergraduates, and graduate students may submit queries directly from public computer terminals on campus or from their respective homes using a computer terminal and modem.

Problems and/or Failures:

We don't have solid information to indicate the extent to which the information provided in the ERIC abstracts or microfiche are actually helpful to teachers and administrators in solving professional problems. We have reason to believe that ERIC citations

are useful to students in organizing and writing papers for college classes. However, we don't know the extent to which this information resource saves students or faculty time in gathering background information or in actually solving professional problems.

Persons who frequently use the ERIC search procedure have been frustrated at times in selecting the correct descriptors to identify articles or reports on their specific topic. The procedure limits the user to a maximum of 3 descriptors per question. The combination of these descriptors into one of the six alternative Boolean search expressions may not be understood by some users, and they may receive a set of abstracts which satisfy the Boolean expression but frustrate the person seeking information. We are using periodic seminars to assist students and faculty in overcoming this breakdown in communication.

We believe that security of our data files and search procedure is now sufficiently tested that we can offer this ERIC search resource to our entire student body. However, experience has cautioned us to avoid challenging hackers with boasting.

Michigan Professional Personnel Register:

The Michigan Professional Personnel Register is the annual census of Michigan Public Schools' teachers, administrators, and other professionals. It includes information about their teaching assignment, degree, academic majors, teaching experience, race, sex, and other personnel data.

We started collecting copies of the Register in 1970 in order to determine where graduates of the WSU College of Education were

employed. There were many strong opinions expressed, but the analysis of data in the Register enabled us to calculate precise answers. Our annual collection of the data in the Register established a longitudinal data base which provided the raw material for many studies of our College and its graduates.

For each of the past 15 years, the Register has contained 1-line data on 90,000 to 110,000 professionals. This amounts to a cumulative data base of more than 45 million pieces of information,e.g.,

(100,000 records) (30 fields/record) (15 years) = 45 million.

Successes:

Analyses of this data base using Set Theoretic Data Structure (STDS) and original FORTRAN programs enabled us to establish that 95% of our graduates employed in Michigan Public Schools were employed in public schools of Wayne, Oakland, and Macomb Counties. (1)

We were able to identify the patterns of public school employment of graduates of other Michigan universities in what appeared to be spheres of influence (2). Graduates of the WSU College of Education scarcely ever entered employment of school districts outside the tri-county area. This defined our urban student body and a mission to support the professional development of teachers and administrators who were grappling with the problems of provinding suitable instruction for the children and youth of Metropolitan Detroit.

The availability of longitudinal data made it possible to identify changes which were ordinarily hidden. Using the social security numbers, teaching assignment codes, and school district codes we were able to establish the 17% to 20% personnel changes which

occurred each year in the public schools of Wayne, Oakland and Macomb Counties (18). Changes in employment of ethnic minorities as teachers and administrators could be established (10). Availability of salary data made it possible to compare salaries of male and female administrators with equivalent professional education and experience (6). Indeed, a letter from Michigan School Board President Mary Jean Kelly in 1976 indicated that this information had been helpful in shaping a policy statement on sex discrimination in employment in Michigan Public Schools:

> "I want you to know that I much appreciated your sending your study on comparative salaries of male and female administrators in Michigan Public Schools. I have made extensive use of it, especially in urging adoption by the State Board of Education of the Guidelines for the Elimination of Sexism."(21,22)

Other studies have traced the time which beginning teachers will remain unemployed as teachers before moving out of the available teacher supply and into alternative career paths (12). This tends to dampen the optimistic view of some that a large supply of qualified teachers has accumulated and waits eagerly to be employed by public schools. At least one study suggests that teaching competence and professional qualifications often have little to do with employment of substitute teachers for daily or protracted employment (14).

Problems and/or Failures:

Removal of the salary data from the Register eliminated the opportunity to do comprehensive studies which would use the public record to identify salary discrimination due to race, sex, or age. In other words, we could not repeat the study (6) which documented salary discrimination between male and female administrators of equivalent education and experience. We could not repeat today the 1978 study (10) comparing salaries of ethnic minority and caucasian administrators. A discussion of the reasons for removing this important piece of information from the public record could be long and heated.

Computer Based Resource Units:

During the 1960's and 1970's, Professor Robert Harnak (SUNY at Buffalo) worked with teachers to identify a set of teaching activities and instructional materials which they found helpful in individualizing instruction. This collection covered more than 50 topics, including classroom management, movigenics, sensory perception. The information was coded and entered into a computer file. Harnak developed the software to search and retrieve this information (23).

Successes:

We were fortunate to acquire this data base and explore the use of it with small groups of teachers and undergradautes. Beginning teachers and student teachers found the teaching suggestions helpful in identifying several teaching activities related to a specific

instructional objective.

The topics focus upon practical situations and tasks which teachers confront each day. The suggestions have a flavor of the practitioner's concern for the "real world of the classroom." The objectives are explicit and clear to teachers, e.g.,

"10.To reduce excessive talking."

For example, the topic "Going To and From School" presents a variety of instructional objectives, suggested teaching activities, and instructional materials which are related to each objective. The collection of ideas are suitable for the primary level teachers, who are concerned about children building habits of safety in school, on the playground, and in their neighborhoods(7).

Special Education teachers found a broad selection of activities in the unit "Movigenics", which they could use to build children's body awareness, spatial awareness, physical coordination, tactual and visual skills.

Problems and/or Failures:

Sharp reductions in financing education during the past 5 years have ended development of Harnak's CBRU model and maintenance of the file at SUNY (Buffalo) has been minimal.

WSU's College of Education has maintained a version of CBRU as established during the 1970's and we are testing it again to provide on-line access to student teachers to enable them to find and retrieve CBRU resource guides as their situations may require.

At this time, it is not clear to us the extent to which the teaching activities and the books or filmstrips suggested by the CBRU

procedure will still be useful after almost 10 years.

It may be that many of the problems encountered by classroom teachers in the 1970's are not substantially different from the classroom problems faced by teachers in the 1980's. Perhaps the teaching suggestions of experienced teachers of the 1960's will benefit and stimulate the thinking of teachers of the 1980's to find acceptable solutions to problems which they're encountering. We are in the process of testing this hypothesis.

Michigan Educational Assessment Program:

Since 1970 the Michigan Department of Education has collected baseline data to indicate achievement of fourth and seventh grade pupils in all of Michigan's Public Schools in mathematics and reading. The shift from normative-based measures to performance based measures occurred about 1973, and in 1986 the testing extends into the high schools and into other curriculum areas.

We have collected MEAP data from Michigan Department of Education for individual schools and districts since 1970. However, access to the data required a signed pledge by the user not to identify any school or district by name with its associated test scores. While we and other professional educators have complied with this pledge, the news media publish test scores and names of schools and school districts, along with their editorial commentary upon the strengths and weaknesses which they find in the achievement of one or more schools or districts.(24)

Successes:

The longitudinal process of collecting achievement test data from samples of pupils throughout Michigan was an important accomplishment of the administration of former Supt. John Porter. The data collection has been extended to the secondary schools and to other curriculum areas. Moreover, the Department is beginning to develop evaluation instruments which may measure critical thinking and other higher level cognitive processes. Many teachers and administrators have found the MEAP data useful in changing or emphasizing certain aspects of their school programs. Apparently, the general public has also found this appraisal helpful. These are significant accomplishments of the public schools and the Michigan Department of Education.

Problems and/or Failures:

At Wayne State we have made minimal use of these data. They have provided the basis for sporadic studies by faculty and students.

We could use these data to enable student teachers to recognize deficiencies of pupils in the classrooms where they are teaching. With support of College faculty, they could plan strategies to correct deficiencies and plumb the depths of pupils' understandings with more sophisticated diagnostic test instruments.

Graduate students in the same school or district could coordinate their graduate studies toward improving achievement deficits indicated by the annual MEAP reports. The MEAP data are in machine processible form and most teacher education institutions have the computing power to support these applications.

One limitation is that a researcher cannot publish reports which

include the names of schools or school districts with the results of their MEAP tests. To do so would mean that the researcher would probably forfeit access to the data in the future and commit an unethical breach of a written pledge not to reveal those names. On the other hand, the public press points to the MEAP achievement scores of schools and districts by grade level and subject area, while editorializing upon the implications of the data(24).

One glaring failure has been the ineffectiveness of interpreting the MEAP data and their implications to the public, legislators, and decision makers throughout the State.(11) For example, it is incredible that the public and the news media would be surprised and alarmed at the extent of illiteracy among Detroit's Black youth 17 to 25 years of age. Their annual MEAP test data since 1970 had been showing 40% to 50% of the fourth and seventh graders in Detroit had not achieved the minimal skills in reading and arithmetic. These young people were academically disabled when they entered the workforce and severely impaired at learning a new skill or trade when layoffs errupted during the 1980's.(11) This condition persists in other urban centers throughout Michigan, including Pontiac and Benton Harbor.

WSU College of Education Data Base:

Registration data of College of Education students are collected each term. For each student record, there are 30 different fields including name, social security number, address, rank, major, courses completed, grades, and similar information. Our data base extends from 1970 to 1986 and contains as many as 25,000 records collected in 1970 to 10,000 records collected in 1985. We also have access to the files

which indicate students who graduated from the College each term.

Successes:

We've been able to use the students' zip codes to indicate the cities and counties where our undergraduates and graduate students reside.

Using the social security number with registration data makes it possible to identify patterns of enrollment each term by our urban students.(1) These appraisals produced results which were sometimes in conflict with the rule-of-thumb expectations of some university administrators.

With the identification number included in the record of graduates from a program and the Michigan Professional Personnel Register, we are able to determine the number of our graduates who are employed in public school districts in Wayne, Oakland, and Macomb counties. Our graduates compose 30% to 50% of the teaching staffs in this tri-county area.

Another benefit of this sytem is the speed and accuracy of collecting information about students and graduates when it's time for accreditation review of professional programs. In June 1984 the National Council for Accreditation of Teacher Education (NCATE) accredited all programs of the WSU College of Education intended to provide professional education for teachers, administrators, and other professional school personnel.(19)

This produced a spin-off data base of more than 60 data files which describe the College's programs using NCATE's standards for accreditation. Moreover, it provided the foundation for our response to the scheduled accreditation review of all University programs by the North Central Association in April 1986.

Problems and/or Failures:

The accreditation process places a heavy strain upon faculty, who must continue their teaching, service, and research responsibilities while collecting information and writing responses to the accreditation criteria. After the accreditation review is completed, there's a letdown in faculty concern about documenting program changes and devlopment. Neglecting to update the spin-off data base can result in a data base that scarcely resembles current program goals, courses, requirements. Periodic updating of any data base is an investment necessary for having a useful data base.

Another problem occurred when College faculty and administration attempted to establish and maintain another data base to monitor the competencies achieved by students as they moved through their professional courses and field experiences. The recordkeeping burden for faculty and students was horrendous. More details were required by the system and distracted faculty as well as students from their central purpose of developing a competent and enthusiastic teacher. Finally, the computer-based system became so unwieldy that it was abandoned, but not before substantial damage had been done to some of the College's programs.

REFERENCES

1. Gary R. Smith, "Study of Enrollment in the College of Education During 1969-1973 and Patterns of Student Residence in Wayne, Oakland or Macomb Counties," unpublished, Wayne State University, Detroit, MI, October 1973, 30 pages.

2. _____, "Teachers and Administrators Trained at Seven State Institutions and Their Distribution Throughout Michigan Intermediate School Districts," unpublished, Wayne State University, Detroit, MI, February 1974, 14 pages.

3. _____, "Study of the Michigan Professional Personnel Register 1967-1974," unpublished, Wayne State University, Detroit, MI, December 1974, 41 pages.

4. _____, "Commentary on the Supply and Demand for Teachers in Michigan,"unpublished, Wayne State University, Detroit, MI, February 1975, 29 pages.

5. _____, "Comparison of Employment Patterns by Curriculum for Public School Teachers in All Michigan Districts and in the Intermediate School Districts of Macomb, Oakland and Wayne," unpublished, Wayne State University, Detroit, MI, September 1975, 23 pages.

6. _____, "Comparison of Average Salaries of Male and Female Administrators in Michigan Public Schools (1973-1974)," Resources in Education (ERIC Doc. No. ED116356), May 1976, 8 pages.

7. Robert Barnard, The Relationship Between Reading Achievement of Pupils in Special Education and Teacher Access to an Instructional Materials Bank, unpublished doctoral dissertation, Wayne State University, Detroit, MI, June 1976, 180 pages.

8. Gary R. Smith and Inayat Shallwani, "Computer Simulation of the Supply and Demand for Teachers in Michigan Public Schools," Resources in Education (ERIC Doc. No. ED160059), January 1978, 46 pages.

9. Gary R. Smith, "A Computer Based Information System to Support a College of Education," Educational Technology, April 1977, pages 51-53.

10. _____, "Changes in Employment of Ethnic Minority and Caucasian Administrators in Michigan Public Schools," Secondary Education Today, April 1978, pages 19-27.

11. _____, "Limiting the Number of New Teachers," MATE Viewpoints Michigan Association of Teacher Education, Fall 1978, pages 14-19.

12. _____, "Estimating the Number of Newly Certified Teachers Who Do Not Enter Teaching in Michigan Public Schools," Resources in Education (ERIC Doc. No. ED161838), March 1979, 23 pages.

13. Gary R. Smith and Cheryl Earnley, "Certification, Employment, and Attrition of the Professional Personnel in Michigan Public Schools," unpublished, College of Education, Wayne State University, Detroit, MI, May 1980, 172 pages.

14. Gary R. Smith, "Preliminary Report of Study of Teacher Absences and Substitute Teacher," unpublished, College of Education, Wayne State University, Detroit, MI, September 1980, 16 pages.

15. _____, "Certification, Employment and Attrition of Special Education Professional Personnel in Michigan," Resources in Education (ERIC Doc. No. ED207294), February 1982, 45 pages.

16. _____, "Certification, Employment and Attrition of Special Education Professional Personnel in Michigan," Resources in Education (ERIC Doc. No. ED226525), July 1983, 36 pages.

17. J. Edward Simpkins (Editorial Chairperson), "Report of State Recentralization Committee for the School District of the City of Detroit," unpublished, Wayne State University, Detroit, MI, January 1982, 32 pages.

18. Gary R. Smith and Cheryl Earnley, "Changes in the Assignment of Teachers and Administrators in Tri-County Public Schools," Secondary Education Today, Fall 1983, pages 42-47.

19. Gary R. Smith (Editor and Coordinator), "Instutitional Report to National Council for Accreditation of Teacher Education (Volumes 1-4)," unpublished, College of Education, Wayne State University, Detroit, MI, December 1983, 82 pages.

20. Gary R. Smith and Cheryl Earnley, "OFISfile, B25 Network Provide Solutions for University Information System," Burroughs World, December 1985, pages 14-15.

21. Mary Jean Kelly, President of Michigan State Board of Education (1976), letter to Gary R. Smith (1-6-76).

22. Guidelines for Eliminating and Preventing Sex Discrimination, Michigan Department of Education, Lansing, 1976, 24 pages.

23. James E. Eisele, Computer Assisted Planning of Curriculum and Instruction, Educational Technology Publications, Englewood Cliffs, N. J., 1971, 130 pages.

24. "Michigan Students Improve Scores on Standardized Tests," Detroit Free Press, January 23, 1986, page 1A.

25. John F. Vinsonhaler, et. al., Basic Information Retrieval System (BIRS), Michigan State University, East Lansing, MI, December 1970.

26. David Childs, "Set Theoretic Data Structure (STDS)," University of Michigan, Ann Arbor, MI.